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Ultra high density WDM transmission equipment using optical duobinary
coding and polarization interleave multiplexing

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In the beginnings

As approaching a future multimedia society in which image information shall be a main constituent, demands for high capacity on trunk optical communication networks are increased. In most recent years, by utilizing a wavelength division multiplexing technology, transmission experiments each in which the total capacity exceeds one terabit have been reported from respective sites [1-4], and therefore, the momentum of terabit-class ultra-high capacity transmission realization including device development is further increased.

In the case where the wavelength division multiplexing technology is used, at the present time, the total transmission capacity is restricted by an amplification band of an erbium-doped optical fiber amplifier. Therefore, in order to further increase the capacity in the restricted band, it is necessary to enhance frequency utilization efficiency. As one approach thereof, in the past, we, the authors, have proposed the utilization of optical duobinary signal, and also, have experimentally clarified that the frequency utilization efficiency can be enhanced up to 0.6bit/s/Hz [4]. In order to achieve the further improvement of the frequency utilization efficiency, there may be the utilization of a multi-level modulation format used in wireless communications or the utilization of two polarization axes of an optical fiber. Herein, there will be reported a reviewing result of the improvement of the frequency utilization efficiency by utilizing the two polarization axes.

(The rest is omitted.)